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US Serial No. 10/505251
Page 2 of 11Remarks:

Claims 1-13 and 15-22 are pending in this application.

Regarding the rejection of claims 1-8, 12, 13, 15-17, 20, 21 and 23 under 35 USC 103(a) as allegedly being unpatentable over US 6,013,304 to Todd in view of XP-002249876 to Schieberle or WO 03/041515 to Berchtold et al. (hereinafter "Berchtold"):

Applicants respectfully traverse the rejection of the foregoing claims over Todd in view of Schieberle or Berchtold.

Prior to discussing the merits of the Examiner's position, the undersigned reminds the Examiner that the determination of obviousness under § 103(a) requires consideration of the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1 [148 USPQ 459] (1966): (1) the scope and content of the prior art; (2) the differences between the claims and the prior art; (3) the level of ordinary skill in the pertinent art; and (4) secondary considerations, if any, of nonobviousness. *McNeil-PPC, Inc. v. L. Perrigo Co.*, 337 F.3d 1362, 1368, 67 USPQ2d 1649, 1653 (Fed. Cir. 2003). There must be some suggestion, teaching, or motivation arising from what the prior art would have taught a person of ordinary skill in the field of the invention to make the proposed changes to the reference. *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). But see also *KSR International Co. v. Teleflex Inc.*, 82 USPQ2D 1385 (U.S. 2007).

A methodology for the analysis of obviousness was set out in *In re Kotzab*, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher."

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It must also be shown that one having ordinary skill in the art would reasonably have expected any proposed changes to a prior art reference would have been successful.

Amgen, Inc. v. Chugai Pharmaceutical Co., 927 F.2d 1200, 1207, 18 USPQ2d 1016, 1022 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988); *In re Clinton*, 527 F.2d 1226, 1228, 188 USPQ 365, 367 (CCPA 1976). "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988).

With respect to independent claim 1, the Patent Office acknowledges that Todd does not teach use of seeds and in the lower limit of the temperature range (see page 2 of the Office Action). The Patent Office introduces Schieberle as allegedly remedying the deficiencies of Todd by allegedly teaching a process of making treated sesame seeds by roasting sesame seeds at temperatures of 180°C for 30 minutes, which contain 2-furfurylthiol, to generate an intense flavor. The Patent Office alleges that it would have been obvious to use the seeds of Brassica as disclosed by Schieberle and the higher temperature as shown by Schieberle in the process and product of Todd for the function of producing flavor modifying ingredients such as FFT since Schieberle discloses that FFT is produced by temperatures of 180°C.

Alternatively, the Patent Office introduces Berchtold as allegedly remedying the deficiencies of Todd by allegedly teaching roasting seeds from various families including cruciferum and brassica by continuously heating seeds to a predetermined temperature. The Patent Office alleges that it would have been obvious to vary the temperature as shown by Berchtold in the process of Todd.

The Patent Office also alleges that (1) even though Sesame seeds are not Brassica seeds, they contain the same 2-furfurylthiol which is developed on heating, and now Brassica plants containing seeds have been disclosed which can be treated at high temperatures to extract flavors; (2) since the chemical compound of 2-furfurylthio (2-FFT) would be the

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same no matter what type of seed was used, then heating it to temperatures within the claimed amount would develop the 2-FFT, and (3) it would have been obvious to treat other seeds containing 2-FFT with heat at even higher temperatures in order to develop 2-FFT as to further treat as shown by the present claims.

Applicants respectfully disagree with the above-identified allegations by the Patent Office.

Applicants take this opportunity to remind the Patent Office that claim 1 requires heating Brassica seeds for at least 10 minutes at a temperature within a range of from about 160°C to about 250°C.

Todd discloses a process for rapidly extracting and concentrating the principle components of herb and spice solids, at temperature of at least 130°F, preferably 103°F to about 450°F (see col. 4, lines 15-19). The claims of Todd specify that the process comprises a plurality of mixing and pressing steps, and that the pressing steps are carried out at a temperature of 130°F – 450°F (54°C – 232°C).

Todd does not teach or suggest that it is possible to treat plant solids, particularly, Brassica seeds, in a way which results in the Brassica seeds having flavor modifying properties. In contrast, Todd is directed towards providing a process for obtaining plant extracts and residual cakes with increased stability and reduced microbial counts. Additionally, the results achievable from Todd's processes are not the same or substantially similar compared to the results obtained by the presently claimed process.

Todd teaches mixing plant solids with oil and then rapidly pressing the mixture at a temperature of 130°F – 450°F. The mixing step of Todd is not carried out at an elevated temperature, only the pressing steps are conducted at the elevated temperature. Although Todd does not define what is meant by rapidly, Example 1 of Todd clearly states that the residence time in each press is 5-60 seconds. This is far shorter than the presently claimed 10 set forth for the present invention.

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Todd's rapid crushing and pressing of the seeds at the elevated temperature is in complete contrast to the presently claimed process whereby the seed are not crushed or pressed before heating, and the heating of the seeds is over a longer period of time. Moreover, Brassica seeds contain sulphur containing glucosides and glucosinolates, which through the action of an enzyme (which also present in Brassica seeds), break down to form strongly tasting substances, predominately thiocyanates and isothioates, which impart a bitter pungent taste. Crushing and pressing the seeds mixes this enzyme with the glucosides and glucosinolates and forms the bitter tasting compounds (i.e., crushed mustard seeds). To avoid these bitter tasting compounds from being formed, the Brassica seeds are heated whole and the enzyme responsible for the formation of these bitter tasting compounds is denatured. If this heating process is too rapid in duration, as taught by Todd, the enzyme will not be denatured throughout the Brassica seeds and the Brassica seeds will contain have the bitter tasting compounds.

So, the time in which the Brassica seeds are crushed or pressed, the temperature and the duration of time are factors which enable the results of the present invention to be achieve. On the other hand, Todd does not teach or suggest any such features. In fact, Todd teaches away from the present invention because Todd encourages crushing or pressing the seeds at the same time as rapidly heating the seeds. Moreover, neither Schieberle or Berchtold remedy these deficiencies of Todd.

Schieberle teaches that roasting of rather odorless Sesame seeds can generate an intense flavor. Specifically, Schieberle teaches roasting at 180°C for 30mins which results in the presence of FFT in the treated sesame seeds. However, Sesame plants belong in a different branch of the taxonomic hierarchy to Brassica plants. Sesame plants are not part of the same family, order or subclass as Brassica plants. The Brassica and Sesame plants share the same class but this more or less just indicates that Sesame and Brassica plants are angiospermes (i.e. flowering plants), which also happens to be the most widespread group of land plants.

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A person of ordinary skill in the art would know that the behavior of Brassica seeds could not be predicted based on the behavior of Sesame seeds, which is one of countless angiosperms. The reason for this is that the biochemistry of Sesame seeds is completely different to the biochemistry of Brassica seeds. Unlike Brassica seeds, Sesame seeds do not contain the sulphur containing glucosides and glucosinolates precursors which lead to the formation of isocyanates. Therefore, one of ordinary skill in the art does not have to over the same problems in producing a Sesame seed with flavor modifying properties as compared to a Brassica seed with flavor modifying properties.

Contrary to the Patent Office's allegation that if one seed can be roasted to have flavor modifying properties, then it is obvious that other seeds can, Applicants submit that it is not obvious to a skilled artisan which seeds can be roasted to have flavor modifying properties because there are far too many types of plant seeds to that can be selected.

Berchtold teaches that heating Brassica seeds at 120°C for 15 minutes can increase the nutritional and industrial properties of the seeds. However, Berchtold teaches away from our process because Example 2 of Brassica teaches that the seeds are heated to a maximum temperature of 120°C (see page 4). The maximum temperature taught by Berchtold is below the claimed range of 160 – 250°C. Additionally, Berchtold teaches that the seeds can be processed in a fragmented condition (see page 5, lines 18-20).

Todd, Schieberle and Berchtold, taking singly or in combination, fail to teach or suggest a step of heating Brassica seeds, under a temperature and for at 10 minutes to result in Brassica seeds having flavor modifying properties wherein the Brassica seeds are heated to a temperature within a range of from about 160°C to about 250°C as required by claims 1, 6, 7, 8, 12 and 15.

Because the features of claims 1, 6, 7, 8, 12 and 15 are not taught or suggested by Todd, Schieberle and Berchtold, taken singly or in combination, these references would not

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have rendered the features of claims 1-8, 12, 13, 15-17, 20, 21 and 23 obvious to one of ordinary skill in the art.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-8, 12, 13, 15-17, 20, 21 and 23 under 35 U.S.C. 103(a) are respectfully requested.

Regarding the rejection of claims 1-7, 12, 15, 16, 20 and 21 under 35 USC 103(a) as allegedly being unpatentable over Todd in view of XP-009014888 to Vasundhara et al. (hereinafter "Vasundhara"):

Applicants respectfully traverse the rejection of the foregoing claims over Todd in view of Vasundhara.

As set forth above, the Patent Office acknowledges that Todd does not teach use of seeds and in the lower limit of the temperature range (see page 6 of the Office Action). The Patent Office introduces Vasundhara as allegedly remedying the deficiencies of Todd by allegedly teaching that mustard seed can be roasted which brings about a flavor change. The Patent Office alleges that it would have been obvious to treat Brassica seeds containing 2-FFT as shown by Vasundhara in the process and product of Todd and to heat at even higher temperatures in order to develop 2-FFT as shown by Todd.

Applicants respectfully disagree with the above-identified allegations by the Patent Office.

As discussed above, Todd teaches a rapid heating process whereby seeds are crushed or pressed at the same time as the seeds are being rapidly heated. Todd does not teach or suggest the process as recited in claim 1. Vasundhara does not remedy the deficiencies of Todd because Vasundhara merely teaches a distinct taste in the flavor of roasted seeds as the result of heat treatment. Vasundhara does not teach how to treat Brassica seeds so as to form Brassica seeds with flavor modifying properties as required by the present claims. Vasundhara teaches to hand pound the mustard seeds and to roast the powder at

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temperature of 120°C. Similar to Todd, this process of crushing the seeds prior to heat treatment would not achieve the same or substantially similar results as the results obtained from the presently claimed process. And like Todd, Vasundhara's process also teaches away from the present invention.

Todd and Vasundhara, taking singly or in combination, fail to teach or suggest a step of heating Brassica seeds, under a temperature and for at 10 minutes to result in Brassica seeds having flavor modifying properties wherein the Brassica seeds are heated to a temperature within a range of from about 160°C to about 250°C as required by claims 1, 6, 7, 12 and 15.

Because the features of claims 1, 6, 7, 12 and 15 are not taught or suggested by Todd and Vasundhara, taken singly or in combination, these references would not have rendered the features of claims 1-7, 12, 15, 16, 20 obvious to one of ordinary skill in the art.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-7, 12, 15, 16, 20 and 21 under 35 U.S.C. 103(a) are respectfully requested.

Regarding the rejection of claims 9-11 and 16-19 under 35 USC 103(a) as allegedly being unpatentable over Todd in view of Schieberle, Berchtold or Vasundhara and further in view of US 3,697,290 to Lynn:

Applicants respectfully traverse the rejection of the foregoing claims over Todd in view of Schieberle, Berchtold or Vasundhara and further in view of Lynn.

The Patent Office alleges that the combination of Todd, Schieberle, Berchtold or Vasundhara in view of Lynn teaches or suggests each and every feature recited in claims 9-11 and 16-19. The Patent Office alleges that (1) it is known that treated seeds are edible, and it would have been obvious to use them in particular amounts for their known functions, (2) the particular amount of FFT as in claims 16-20 is seen to have been within

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the skill of the ordinary worker, since it is known that these seeds generate FFT, and in cooking, one uses ingredient according to how they will make a product taste, and (3) it would have been obvious to use known ingredients which contain FFT for their known function of imparting flavoring and nutrition.

Applicants respectful disagree with the above-identified allegations by the Patent Office.

As discussed above, Todd teaches processes whereby seeds are crushed at the same time as rapidly being heated which teaches away from the present invention. Vasundhara does not remedy the deficiencies of Todd because Vasundhara teaches a process whereby seeds are hand pounded and then the powder is roasted at 120°C which also teaches away from the present invention. Schieberle and Lynn fail to remedy the deficiencies of Todd because Schieberle and Lynn are directed to processes employing Sesame seeds which have an different biochemistry than Brassica seeds. Berchtold does not remedy the deficiencies of Todd because Berchtold teaches heating seeds at a maximum temperature of 120°C. For the forgoing reasons, Schieberle, Berchtold, Vasundhara and Lynn, taken singly or in combination, do not remedy the deficiencies of Todd as set forth above.

Todd, Schieberle, Berchtold, Vasundhara, and Lynn, taking singly or in combination, fail to teach or suggest a step of heating Brassica seeds, under a temperature and for at 10 minutes to result in Brassica seeds having flavor modifying properties wherein the Brassica seeds are heated to a temperature within a range of from about 160°C to about 250°C as required by claims 11 and 19. Moreover, Todd, Schieberle, Berchtold, Vasundhara, and Lynn, taking singly or in combination, fail to teach or suggest a consumable comprising 2-furfurylthiol present in either treated *Brassica* seeds, or in an extract thereof, wherein the concentration of 2-furfurylthiol in the consumable is 0.5 – 1000 µg/kg of the consumable as required by claim 18.

Because the features of independent claims 11, 18 and 19 are not taught or suggested by Todd, Schieberle, Berchtold Vasundhara, and Lynn, taken singly or in combination, these

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references would not have rendered the features of claims 11, 18 and 19 obvious to one of ordinary skill in the art.

Accordingly, reconsideration and withdrawal of the rejection of claims 9-11 and 16-19 under 35 U.S.C. 103(a) are respectfully requested.

Should the Examiner in charge of this application believe that telephonic communication with the undersigned would meaningfully advance the prosecution of this application, they are invited to call the undersigned at their earliest convenience.

The early issuance of a *Notice of Allowability* is solicited.

PETITION FOR A ONE-MONTH EXTENSION OF TIME

Applicants respectfully petition for a one-month extension of time in order to permit for the timely entry of this response. The Commissioner is hereby authorized to charge the fee to Deposit Account No. 14-1263 with respect to this petition.

CONDITIONAL AUTHORIZATION FOR FEES

Should any further fee be required by the Commissioner in order to permit the timely entry of this paper, the Commissioner is authorized to charge any such fee to Deposit Account No. 14-1263.

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Respectfully Submitted;

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29 June 2009

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Allyson Ross

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